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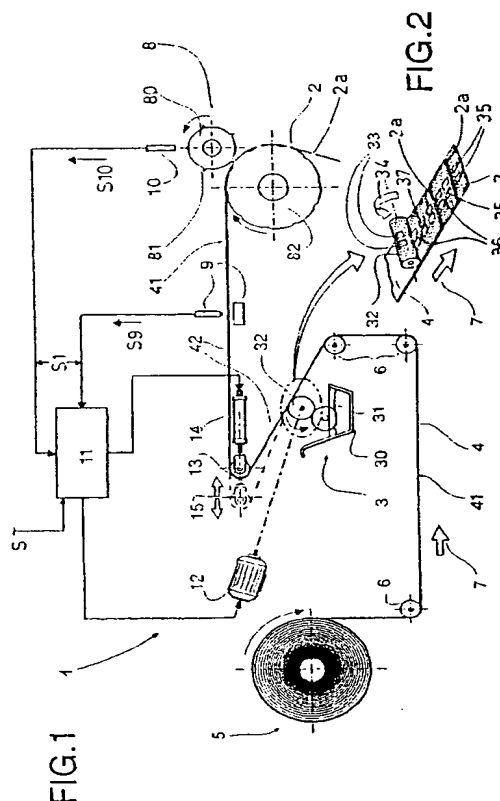
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(54) Method and device for the production of filter tip bands for ventilated cigarettes

(57) Method and device for the production of filter tip bands (2) for ventilated cigarettes, according to which a continuous strip (4) is advanced along a pre-set feed path (41), an adhesive substance is applied to the strip (4) using a gumming device (3), defining on the strip (4) itself a periodic succession of gummed areas (36) alternated with non-gummed areas (35) and the strip (4) is cut using a cutting device (8) according to transversal lines (2a) at pre-set intervals defined by the gummed areas (36) to produce the bands (2); a control device (9, 10 and 11) controls the timing (S1) between the gumming device (3) and the cutting device (8); the timing (S1) is compared with a pre-set value (S) and is corrected, using a correction device (12, 13 and 14) in order to eliminate any variation of the pre-set value (S).



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## Description

The object of the present invention is a method for the production of filter tip bands for ventilated cigarettes.

In particular, the present invention relates to a method for cutting, in a precise and controlled manner, a strip unwound from a reel, to which a gumming device applies a layer of adhesive on one side before it is cut into single pieces, to make filter tip bands.

It is common practise, in the so-called filter tip machines, to apply the filter to the cigarette, wrapping a filter piece and part of the cigarette with a band. The filter piece is double the length of the filter tip of a single cigarette and is placed between two cigarettes; the double cigarette is then cut in half to produce two filtered cigarettes.

The well-known devices capable of producing the bands, basically, include a gumming unit designed to smear an adhesive substance on the continuous strip in pre-set areas and, downstream of the gumming unit, a cutting unit to cut the continuous strip into bands, crossways. The gumming unit includes a gumming roller, whose cylindrical surface has recesses. Because of this shape, the strip, after the gumming, has areas without adhesive material corresponding to these recesses.

The above areas without adhesive material are essential for ventilated cigarettes, or, more precisely, for cigarettes with ventilated filters.

In fact, in these areas, there are ventilation holes, which must not in any way be blocked by the adhesive material.

The above cutting unit generally includes a rotating knife with peripheral blades spaced at an equal distance from each other. These peripheral blades must act on the strip along well defined transversal lines, positioned, in particular, in the space between an area without any adhesive substance and the next one.

In the well-known devices, the transversal cutting of the strip into bands may occur in the wrong place, involving the areas without adhesive substance. A problem of this kind, however the holes are made, creates insufficient ventilation of the cigarettes and/or incomplete closure of the filter tip bands.

The object of the present invention is to provide a method for the production of filter tip bands for ventilated cigarettes, without the problem described above.

The present invention discloses a method for the production of filter tip bands for ventilated cigarettes characterised in that it includes the phases of feeding a continuous strip along a pre-set feed path; applying an adhesive substance to the said strip using gumming means, defining on the strip itself a periodic succession of gummed areas alternated with non-gummed areas; cutting the said strip using cutting means along transversal lines at pre-set intervals defined by the said gummed areas in order to produce the said bands; controlling, using control means, the timing between the said gumming means and the said cutting means; com-

paring the said timing with a pre-set value; and correcting the said timing, using correction means, in order to eliminate variations with respect to the pre-set value.

Moreover, the present invention relates to a device for the production of filter tip bands for ventilated cigarettes designed to carry out the above-mentioned method.

The present invention discloses a device for the production of filter tip bands for ventilated cigarettes characterised in that it includes means for feeding a continuous strip along a pre-set feed path, means for gumming the said strip along the said path, the said means being able to smear an adhesive substance on the said strip, defining on the strip itself a periodic succession of gummed areas alternated with non-gummed areas; means for cutting the said strip positioned downstream of the said gumming means in order to produce the said bands; control means to set the timing between the said gumming means and the said cutting means and to compare the timing itself with a pre-set value; and means for correcting the said timing in order to eliminate any variation with respect to the pre-set value, the said correction means being controlled by the said control means.

The present invention will now be described with reference to the accompanying drawings which illustrate a preferred embodiment of the device by way of example only and in which:

- Figure 1 is a schematic side view of a preferred embodiment of the device, according to the present invention and
- Figure 2 is a schematic perspective view of a part of the device as per Figure 1.

With reference to Figure 1, the numeral 1 indicates the device as a whole for the production of filter tip bands 2 to be attached to filter pieces (not illustrated) for ventilated cigarettes (not illustrated).

The device 1 is part of a cigarette packing machine of a well-known type (not illustrated).

The device 1 includes a gumming unit 3 which smears an adhesive substance on pre-set areas of a continuous paper strip 4.

The continuous strip 4 is unwound in a well-known way from a feed reel 5 and reaches the gumming unit 3 at a pre-set speed in the direction indicated by the arrow 7 and is guided by a series of transmission rollers 6 along a path 41.

The gumming unit 3 includes a cup 30 containing an adhesive substance, a rotating roller 31 partially submerged in the same adhesive substance and a gumming roller 32 tangent to the roller 31 which rotates in an anti-clockwise direction in Figure 1 (arrow 34 in Figure 2) driven by a motor 12.

The gumming roller 32 is designed to transfer the adhesive substance from the surface of the roller 31 to the surface of the strip 4 tangent to it.

As shown in Figure 2, the roller 32 has recesses 33 in its outer surface, into which the adhesive substance cannot penetrate and which, therefore, during the gumming phase, gives a regular succession of areas without adhesive substance 35 to the strip 4.

If the continuous strip 4 is already perforated, these areas 35 must correspond to the perforated areas of the strip 4. The areas without adhesive material 35 are positioned one after the other in the feed direction 7 of the strip and are alternated with completely gummed areas 36, that is, areas completely smeared with adhesive substance from one end of the strip 4 to the other.

As shown in Figure 1, downstream of the gumming unit 3, in the direction 7, along a section 42 of the path 41, there is a cutting unit 8 which cuts the continuous strip 4 transversally into the bands 2.

The unit 8 includes a roller 80, which turns in an anti-clockwise direction in Figure 1 around its own horizontal axis which is perpendicular to the direction 7 at a set rotating speed and is fitted with peripheral blades 81 which are equally spaced out from each other. A drum 82, on an axis parallel to that of the roller 80, feeds the strip 4 along the path 41 in the direction 7 and is designed to operate in conjunction with the roller 80 to cut the strip 4 itself into bands 2 along transversal cutting lines 2a.

The strip 4 reaches the periphery of the drum 82 at a tangent, the drum being fitted with suction means, of a well-known type and not illustrated, which keep the strip 4 against the drum 82 itself.

Again according to Figure 1, the device 1 also envisages control means, consisting of a sensor 9 and a detector 10, and a control unit 11.

The sensor 9 is positioned above the section 42 between the gumming unit 3 and the cutting unit 8 and is used to issue a signal, during the feeding of the strip 4 in the direction 7, when the reference mark on every section of strip 4 which shall, after the cutting, form a single band 2, passes. On the passing of every reference mark which can, for example, consist of an area 35 or a perforation, the sensor 9 sends a signal S9 to the control unit 11.

The detector 10 is connected to the roller 80 and can, on detection of the passing of every blade 81, send a signal S10 to the unit 11.

The unit 11, in which the feed speed of the strip 4 and the angular speed of the knife 80 are pre-set, compares the signal corresponding to the timing between a signal sent by the sensor 9 and a signal sent by the detector 10 with a signal S of a pre-set value.

If there are any deviations higher than the pre-set value with respect to signal S the unit 11 enables the correction means.

In particular, if the control unit 11 detects an incorrect timing between the cutting lines 2a and corresponding gummed areas, the correction means are enabled in order to modify the relative positioning between the blades 81 and the areas 35 so that the cutting is carried

out on the completely gummed areas 36.

The said correction means include a drive motor 12 for the roller 32 whose timing is controlled, in a well-known way, by a command signal sent by the unit 11.

The correction means also include a transmission roller 13 driven by a double-action cylinder 14, the latter being controlled by a signal given by the unit 11.

The roller 13 is connected to the continuous strip 4, in the section between the gumming unit 3 and the sensor 9, in such a way as to extend or shorten the path of the strip 4 between the gumming unit 3 and the cutting unit 8.

In use, the unit 11 constantly compares the signal S1 corresponding to the timing between the signals S9 and S10 with a reference signal S which corresponds to a pre-set value.

Every time a deviation between the signal S1 and the signal S, or an incorrect timing between the cutting lines 2a and the non-gummed areas 35 is detected, the unit 11 can correct the timing to eliminate the deviation by operating on the motor 12 to change, temporarily, the speed of the gumming roller 32 and/or to enable the cylinder 14 to extend or shorten the section 42 of the strip 4 feeding path 41.

## Claims

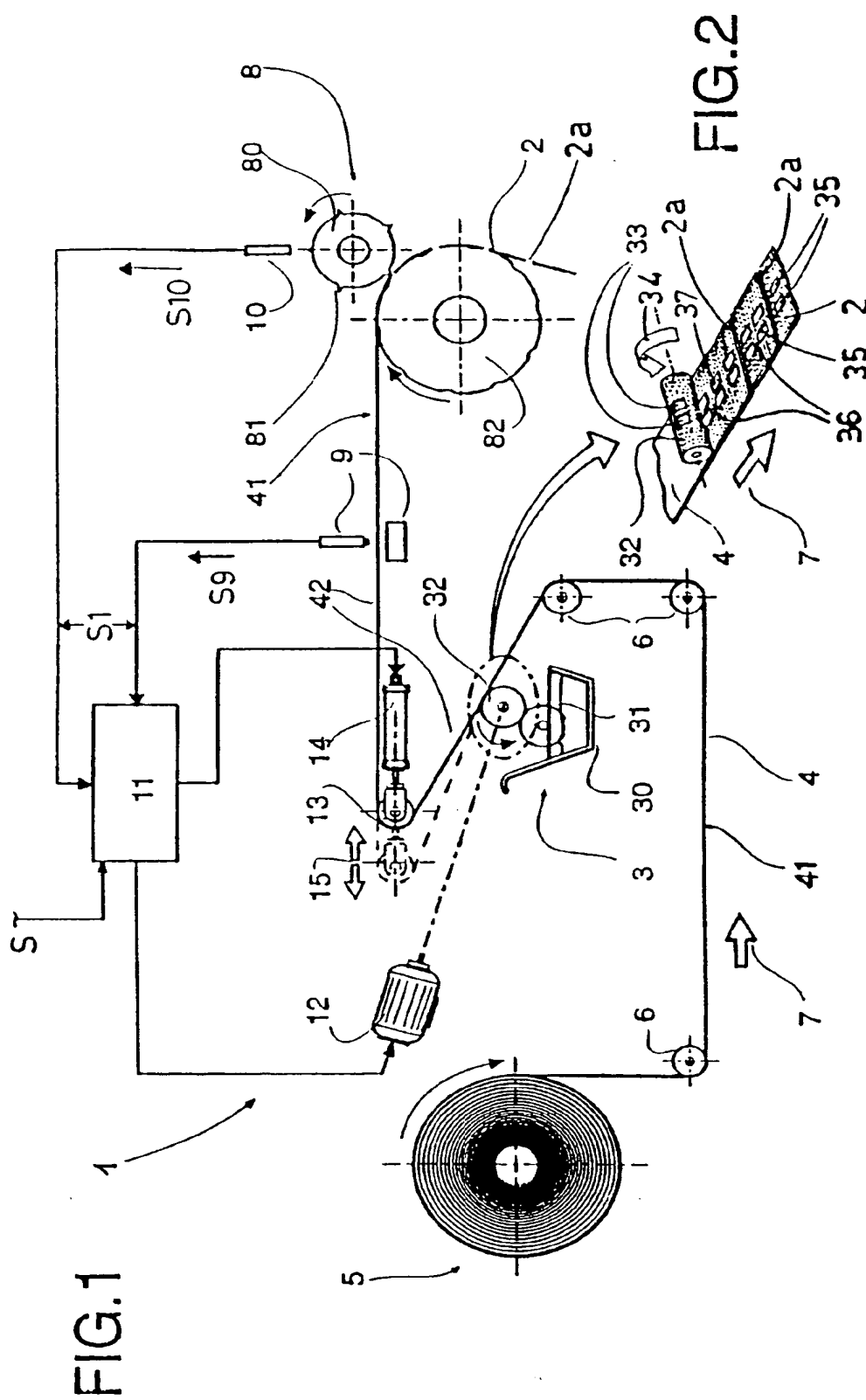
1. A method for the production of filter tip bands (2) for ventilated cigarettes, characterised in that it includes the phases of feeding a continuous strip (4) along a pre-set feed path (41); applying an adhesive substance to the strip (4) using a gumming device (3); defining on the strip (4) itself a periodic succession of gummed areas (36) alternated with non-gummed areas (35) and cutting the strip (4) using cutting means (8) along transversal lines (2a) at pre-set intervals defined by the gummed areas (36) to produce the bands (2); controlling, using control means (9, 10 and 11), the timing (S1) between the said gumming means (3) and the said cutting means (8); comparing the said timing (S1) with a pre-set value (S) and correcting it, using correction means (12, 13 and 14) in order to eliminate any variation with respect to the pre-set value (S).
2. The method, according to claim 1, characterised in that the said timing (S1) is controlled, by comparing a first signal (S9) indicating the timing of the said gumming means with a second signal (S10) indicating the timing of the said cutting means.
3. The method according to claim 2, characterised in that the defining of the said timing (S1) includes the phases of sending a first signal (S9) resulting from the detection of a reference mark corresponding to a section of the said strip (4) which will form a said band (2); and sending a second signal (S10) relat-

ing to the detection of one of the said cutting lines (2a).

4. The method according to any of the previous claims, characterised in that the said correction means (12) correct the said timing (S1) by modifying the timing of a gumming roller (32) of the said gumming means (3, 30, 31, 32).
5. The method according to any of the previous claims, characterised in that the said correction means (13, 14), correct the said timing 1 by modifying the length of a section (42) of the strip (4) feed path between the gumming means (3, 30, 31, 32) and the cutting means (8, 80, 81).
6. The method according to claim 5, characterised in that the variation in the length of the section (42) of the feed path (41) is carried out by moving a transmission roller (13) of the said strip (4).
7. The method according to any of the previous claims, characterised in that the control of the said timing (S1) is carried out by detecting, using the sensor (9), the passing of the said areas (35, 36) and, using the said detector (10), the passing of a blade (81) of the cutting means (8, 80, 81) and sending the signals (S9, S10) resulting from these detections to a unit (11) which is part of the said control means (9, 10, 11) and which controls the said correction means (12, 13, 14).
8. A device for the production of filter tip bands (2) for ventilated cigarettes, characterised in that it includes means (82) for feeding a continuous strip (4) along a pre-set feed path (41); gumming means (3) for the said strip along the said path (41), the said means (3) being designed to apply an adhesive substance to the strip (4); setting on the strip (4) itself a periodic succession of gummed areas (36) alternated with non-gummed areas (35); cutting means (8) for the said strip (4) downstream of the said gumming means (3) to cut the said strip (4) along transversal lines (2a) at pre-set intervals defined by the gummed areas (36) to produce the bands (2); control means (9, 10 and 11) to control the timing (S1) between the said gumming means (3) and the said cutting means (8) and to compare the said timing (S1) itself with a pre-set value (S); and correction means (12 and 14) for the said timing (S1) to eliminate any variation with respect to the pre-set value (S), the said correction means (12 and 14) being controlled by the said control means (9, 10 and 11).
9. The device according to claim 8, characterised in that the said control means (9, 10 and 11) include first means (9) which send a signal (S9) when they

detect a reference mark which corresponds to a section of the said strip (4) which has a set number of non-gummed areas (35) and which form a said band (2); second means (10) which send a signal (S10) when they detect the said cutting lines (2a); and a control unit (11) to set the timing (S1) of the said signals (S9 and S10) and to compare the same timing with the said pre-set value (S).

10. The device, according to claim 8 or 9, characterised in that the said correction means (12 and 14) include motor means (12) for the said gumming means (3) which are designed to modify the timing of the said gumming means.
11. The device, according to any of the claims from 8 to 10, characterised in that the said correction means (12 and 14) include actuator means (14) which can vary the length of a section (42) of the said path (41) extending between the gumming means (3) themselves and the said cutting means (8).





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## EUROPEAN SEARCH REPORT

Application Number  
EP 96 83 0505

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	LU-A-87 956 (HEINTZ VAN LANDEWYCK SARL) * the whole document *	1-3,7,8	A24C5/47
A	GB-A-2 033 726 (HAUNI-WERKE KÖRBER) * the whole document *	1,8	
A	EP-A-0 513 649 (G.D. SOCIETA PER AZIONI) * the whole document *	1,8	
A	GB-A-2 066 130 (MOLINS LIMITED)		
A	EP-A-0 042 665 (GALLAHER LIMITED)		
A	EP-A-0 674 851 (JAPAN TOBACCO INC.)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A24C A24D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10 January 1997	Examiner Riegel, R
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone V : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			

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